APPENDIX B: PROPOSED CLAIMS

1. An apparatus for monitoring a characteristic of a reservoir, comprising:
   a tubular having an elongated body with a longitudinal axis, the tubular being adapted for permanent disposal within a borehole traversing the reservoir;
   at least one antenna disposed on the exterior of the tubular, each at least one antenna having an axis and being adapted for transmission and/or reception of electromagnetic energy;
   the at least one antenna being disposed on the tubular such that its axis is tilted with respect to the axis of the tubular to provide directed sensitivity or transmission of electromagnetic energy within the reservoir; and
   means to activate the at least one antenna to transmit and/or receive electromagnetic energy.

2. The apparatus of claim 1, wherein the reservoir characteristic is resistivity.

3. The apparatus of claim 1, wherein at least two antennas are disposed on the exterior of the tubular such that their axes are tilted with respect to the axis of the tubular to provide directed sensitivity or transmission of electromagnetic energy within the reservoir.

4. The apparatus of claim 1, the tubular further comprising at least one station having a reduced diameter such that a recess is formed about its external circumference, the at least one antenna being disposed in a recessed station.

5. The apparatus of claim 1, wherein an insulating material is disposed between the tubular body and each at least one antenna disposed thereon.

6. The apparatus of claim 1, further comprising a shield positioned on the exterior of the tubular to surround at least one antenna disposed thereon.

7. The apparatus of claim 6, wherein the shield is formed of a material providing transparency to electromagnetic energy.

8. The apparatus of claim 6, wherein the shield is metallic and has at least one slot formed therein.

9. The apparatus of claim 1, the tubular further comprising at least one slot formed along its elongated body, wherein at least one antenna is disposed on the tubular in alignment with the at least one slot.

10. The apparatus of claim 1, further comprising a wireline coupled to the at least one antenna, the wireline adapted to carry a signal from or to the antenna.

11. An apparatus for monitoring a characteristic of a reservoir, comprising:
    a tubular having an elongated body with a longitudinal axis, the tubular being adapted for permanent disposal within a borehole traversing the reservoir;
    at least one antenna disposed on the exterior of the tubular, each at least one antenna being adapted to transmit and/or receive electromagnetic energy; and
    means to activate the at least one antenna to electronically steer the sensing direction of the transmitted and/or received electromagnetic energy.

12. The apparatus of claim 11, wherein the reservoir characteristic is resistivity.

13. The apparatus of claim 11, wherein the at least one antenna comprises a plurality of coils having non-parallel axes.

14. The apparatus of claim 11, the tubular further comprising at least one station having a reduced diameter such that a recess is formed about its external circumference, the at least one antenna being disposed in a recessed station.

15. The apparatus of claim 11, wherein an insulating material is disposed between the tubular body and the at least one antenna disposed thereon.

16. The apparatus of claim 11, further comprising a shield positioned on the exterior of the tubular to surround the at least one antenna disposed thereon.

17. The apparatus of claim 16, wherein the shield is formed of a material providing transparency to electromagnetic energy.

18. The apparatus of claim 16, wherein the shield is metallic and has at least one slot formed therein.

19. The apparatus of claim 11, the tubular further comprising at least one slot formed along the elongated body, wherein the at least one antenna is disposed on the tubular in alignment with the at least one slot.

20. The apparatus of claim 11, further comprising a wireline coupled to the at least one antenna, the wireline adapted to carry a signal from or to the antenna.

21. A method for monitoring a reservoir characteristic, the reservoir being traversed by a borehole, comprising:
disposing a tubular within the borehole, the tubular having an elongated body with a longitudinal axis, the tubular being adapted for permanent disposal within the borehole and having at least one antenna disposed on the exterior of the tubular, each at least one antenna having an axis and being adapted for transmission and/or reception of electromagnetic energy;
disposing the at least one antenna on the tubular such that its axis is tilted with respect to the axis of the tubular to provide directed sensitivity or transmission of electromagnetic energy within the reservoir; and
activating the at least one antenna to transmit and/or receive electromagnetic energy.

22. The method of claim 21, wherein the reservoir characteristic is resistivity.

23. The method of claim 21, comprising disposing at least two antennas on the exterior of the tubular such that their axes are tilted with respect to the axis of the tubular to provide directed sensitivity or transmission of electromagnetic energy within the reservoir.

24. The method of claim 21, the tubular further comprising at least one station having a reduced diameter such that a recess is formed about its external circumference, the at least one antenna being disposed in a recessed station.

25. The method of claim 21, wherein an insulating material is disposed between the tubular body and each at least one antenna disposed thereon.

26. The method of claim 21, further comprising mounting a shield to the exterior of the tubular, the shield positioned to surround at least one antenna disposed thereon.

27. The method of claim 26, wherein the shield is formed of a material providing transparency to electromagnetic energy.

28. The method of claim 26, wherein the shield is metallic and has at least one slot formed therein.

29. The method of claim 21, the tubular further comprising at least one slot formed along the elongated body, wherein the at least one antenna is disposed on the tubular in alignment with the at least one slot.

30. The method of claim 21, further comprising mounting a wireline on the outer surface of the tubular and connecting the at least one antenna to the wireline.

31. A method for monitoring a characteristic of a reservoir, the reservoir being traversed by a borehole, comprising:
disposing a tubular within the borehole, the tubular having an elongated body with a longitudinal axis and adapted for permanent disposal within the borehole;
disposing at least one antenna on the exterior of the tubular, each at least one antenna being adapted to transmit and/or receive electromagnetic energy; and
electronically steering the sensing direction of the transmitted and/or received electromagnetic energy.

32. The method of claim 31, wherein the reservoir characteristic is resistivity.

33. The method of claim 31, wherein the at least one antenna comprises a plurality of coils having non-parallel axes.

34. The method of claim 31, the tubular further comprising at least one station having a reduced diameter such that a recess is formed about its external circumference, the at least one antenna being disposed in a recessed station.

35. The method of claim 31, wherein an insulating material is disposed between the tubular body and the at least one antenna disposed thereon.

36. The method of claim 31, further comprising mounting a shield to the exterior of the tubular, the shield being positioned around the at least one antenna.

37. The method of claim 36, wherein the shield is formed of a material providing transparency to electromagnetic energy.

38. The method of claim 36, wherein the shield is metallic and has at least one slot formed therein.

39. The method of claim 31, the tubular further comprising at least one slot formed along the elongated body, wherein the at least one antenna is disposed on the tubular in alignment with the at least one slot.

40. The method of claim 31, further comprising mounting a wireline on the outer surface of the tubular and connecting the at least one antenna to the wireline.

41. The apparatus of claim 1, wherein the at least one antenna comprises a saddle coil.

42. The method of claim 21, wherein the at least one antenna comprises a saddle coil.